

## Chapter VII

# Information Security Risk in the E-Supply Chain

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### **ABSTRACT**

*Collaboration between supply chain partners, facilitated by integration of information flows, has created more efficient and effective networks. However, the benefits of interconnectivity are not gained without risk. Though essential to support collaboration, increased use of information technology has removed internal and external protective barriers around an organization's assets and processes. Thus, supply chains are better able to satisfy the needs of customers while more vulnerable to an array of IT-specific risks. This chapter identifies the sources of IT threats in the supply chain, categorizes those threats, and validates them by means of a survey of 188 companies representing a range of supply chain functions. Analysis suggests that supply chain risk is affected by IT threats, and therefore the benefits of collaboration facilitated by IT integration must exceed the increase in risk due to IT security threats.*

## **INTRODUCTION**

Supply chain management attempts to coordinate and combine all value chain activities into a single seamless process by emphasizing collaboration and integration across functions and between organizations. Collaboration and integration are increasingly seen as necessary to improve efficiency and effectiveness across a supply chain that has grown in both scope and complexity in recent years. The strategic importance of supply chain management has changed the nature of competition, in that contemporary views of competitive rivalry increasingly see competition between supply chains rather than between firms. Facilitating supply chain management's development is information technology (IT), which has enabled integration of information flows between channel participants thereby reducing uncertainty and risk.

Supply chain management is essentially information driven; supply chains that share information for coordinated decision making achieve maximum efficiency for all channel members. However, by eliminating traditional layers of internal and external separation, which once formed protective barriers around organizational assets and processes, IT-facilitated collaboration has simultaneously improved the supply chain's ability to satisfy customer needs while making it more vulnerable to an array of IT-specific threats. This realization identifies two underappreciated aspects of current SCM. First, there is a lack of understanding as to the extent to which IT-specific threats affect the overall risk within supply chains. Second, while members within highly interconnected supply chains would appear to achieve the greatest benefits, they also appear to be especially vulnerable to IT hazards.

While supply chain risk and information technology risk have been studied in isolation, little has been done to define the impact of information security threats within highly integrated

supply chains. The following addresses this issue by identifying, categorizing, and validating the sources of information security risk within the extended supply chain. To do so, several recent empirical studies, as well as a multi-company survey representing a broad range of supply chain functions, are examined and discussed. The intent is to establish a foundational conceptualization of information security risk within the overall supply chain, and to provide managers and academicians with a better understanding of the relationship between supply chain and information risk. While beyond the scope of the chapter, it is hoped that by defining IT risk in the context of the supply chain, management will be able to identify previously unrecognized or undervalued sources of threats and design improved mitigation strategies for dealing with them.

As the primary goal of this chapter is to establish a foundation from which information security can be studied within the context of supply chain management, the chapter begins with a discussion of the role of collaboration and information technology in improving supply chain performance. This is followed by a short discussion regarding how IT security events can create problems that ripple throughout the supply chain. A review of select supply chain and IT risk models is then presented, the review of IT risk factors including a categorization of IT threats. These models are then merged into a single framework capable of establishing point of origin, threat type, and type of risk to the supply chain caused by IT-specific threats. To assist in further developing the current reality and validate the proposed mode, results and analysis of a large-scale survey conducted in conjunction with a world-leading IT-security services company are presented. The remainder of the chapter contains general recommendations as to how companies may mitigate risk when establishing or operating collaborative partnerships and concluding comments.

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